Amendments to the Claims

1. (original) Apparatus for exposing materials to microwave energy, the apparatus comprising:

   a cylindrical wall extending axially from a first end to a second end and including an interior surface and an exterior surface and defining an axis, the cylindrical wall forming a first slot between the interior and the exterior surfaces;

   an end plate closing off the second end of the cylindrical wall to form a cylindrical chamber;

   a first waveguide forming an opening along the length of the waveguide;

   wherein the first waveguide connects to the cylindrical chamber with the opening in communication with the first slot through which the first waveguide couples microwave energy into the cylindrical chamber.

2. (original) Apparatus as in claim 1 further comprising an elongated member covered with material to be exposed to microwave energy and disposed coaxially within the cylindrical chamber.

3. (original) Apparatus as in claim 2 wherein the elongated member is a metal mandrel.

4. (original) Apparatus as in claim 2 wherein the distance between the interior surface of the cylindrical wall and the elongated member is substantially the same throughout the cylindrical chamber.

5. (original) Apparatus as in claim 2 wherein the distance between the interior surface of the cylindrical wall and the elongated member is great enough to eliminate arcing between the interior surface and the elongated member.

6. (original) Apparatus as in claim 2 wherein the distance between the end plate and the elongated member is great enough to eliminate arcing between the end plate and the elongated member.

7. (original) Apparatus as in claim 1 further comprising a second end plate at the first end of the cylindrical wall.

8. (original) Apparatus as in claim 1 wherein the cylindrical wall further forms a second slot between the interior and the exterior surfaces positioned at a circumferentially spaced location from the first slot and wherein the apparatus further comprises a second waveguide forming an opening along its length and connected to the cylindrical chamber with the opening in communication with the second slot.

9. (original) Apparatus as in claim 8 wherein the first and second slots are formed in the cylindrical wall at diametrically opposed positions.

10. (original) Apparatus as in claim 1 wherein the cylindrical wall forms four slots at 90° circumferential intervals.

11. (original) Apparatus as in claim 1 wherein the slot has a long axis skewed relative to the axis of the cylindrical chamber.

12. (original) Apparatus as in claim 1 further comprising a mode stirrer in the cylindrical chamber at the end plate.

13. (original) Apparatus as in claim 11 wherein the mode stirrer includes a rotatable shaft and a plurality of sector-shaped blades extending from the shaft.

14. (original) Apparatus as in claim 13 wherein at least some of the blades are axially offset from each other.

15. (original) Apparatus as in claim 13 wherein the blades are circumferentially offset from each other.

16. (original) Apparatus as in claim 13 wherein the planes of the blades are parallel to the end plate.

17. (original) Apparatus as in claim 13 wherein the sum of the sectors spanned by all the sector-shaped blades is less than 360°.

18. (original) Apparatus as in claim 1 wherein the first waveguide is rectangular with a pair of opposite narrow walls and a pair of opposite broad walls and wherein the opening in the first waveguide is formed in one of the narrow walls.

19. (original) Apparatus as in claim 1 further comprising spaced apart parallel bars extending across the opening in the first waveguide.

20. (original) Apparatus as in claim 19 wherein the spacing between consecutive parallel bars is constant.

21. (original) Apparatus as in claim 19 wherein the bars are cylindrical.

22. (original) Apparatus as in claim 1 wherein the first waveguide is disposed at an angle relative to the axis of the cylindrical chamber.

23. (original) A waveguide for coupling microwave energy through a slot in the wall of a microwave chamber, the waveguide comprising:

two opposite first walls connected to two opposite second walls to form a length of rectangular waveguide extending in a direction of microwave propagation;

one of the first walls forming an opening along a portion of the length of the waveguide;

a plurality of bars spaced apart in the direction of microwave propagation and extending across the opening;

wherein the waveguide is attachable to a microwave chamber with the opening in communication with a slot in the microwave chamber to couple microwave energy through the opening and the slot into the microwave chamber.

24. (original) A waveguide as in claim 23 wherein the first walls are narrower than the second walls.

25. (original) A waveguide as in claim 23 wherein the bars are cylindrically shaped.

26. (original) A waveguide as in claim 23 wherein the bars are uniformly spaced.

27. (original) A waveguide as in claim 23 wherein the spacing of the bars is selected to produce a selected release of energy into the microwave chamber.

28. (original) A waveguide for coupling microwave energy through a slot in the wall of a microwave chamber, the waveguide comprising:

two opposite first walls connected to two opposite second walls to form a length of rectangular waveguide extending in a direction of microwave propagation;

a pattern of alternating metallic members and gaps formed in one of the first walls of the waveguide;

wherein the metallic members are spaced apart in the direction of microwave propagation along the waveguide;

wherein the waveguide is attachable to a microwave chamber with the gaps in communication with a slot in the microwave chamber to release microwave energy through the gaps and the slot into the microwave chamber in a preselected manner determined by the pattern of alternating metallic members and gaps.

29. (original) A waveguide as in claim 28 wherein the first walls are narrower than the second walls.

30. (original) A waveguide as in claim 28 wherein the metallic members comprise cylindrical bars.

31. (original) A waveguide as in claim 28 wherein the metallic members are uniformly spaced.

32. (original) A waveguide as in claim 28 wherein the pattern of alternating metallic members and gaps is selected to produce a uniform release of energy into the microwave chamber along the length of waveguide.

33. (canceled)

34. (canceled)

35. (canceled)